Rocky Flats Environmental Technology Site

PRE-DEMOLITION SURVEY REPORT (PDSR)

Building 771 Administration Building (West)

REVISION 1

July 12, 2004

CLASSIFICATION REVIEW NOT REQUIRED PER EXEMPTION NUMBER CEX-005-02

1/38

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REVISION 1

July 12, 2004

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ABBREVIATIONS/ACRONYMS

ACM	Asbestos Containing Material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
$DCGL_{EMC}$	Derived Concentration Guideline Level – elevated measurement comparison
$DCGL_W$	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, ventilation, air conditioning
HSAR	Historical Site Assessment Report
HEUN	Highly Enriched Uranyl Nitrate
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NORM	Naturally occurring radioactive material
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition survey
PDSR	Pre-demolition survey report
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSA	Removable Surface Activity
RSOP	RFCA Standard Operating Protocol
RSP	Radiological Safety Practices
SVOCs	Semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure

TSA	Total surface activity
VOCs	Volatile organic compounds
WSRIC	Waste Stream and Residue Identification and Characterization

EXECUTIVE SUMMARY

A Pre-Demolition Survey was performed to enable compliant disposition and waste management of the west side of the Building 771 Administration Area (referred to herein as Area AA West). Because this area will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP). Building surfaces characterized as part of this PDS include the interior surfaces of Area AA West.

The PDS encompassed both chemical and radiological characterization. The characterization was built upon physical, chemical and radiological hazards identified in the facility-specific *B771 and B774 Hazards Characterization Report for the 771 Closure Project.*

Based upon the results of this PDSR, Area AA West meets the unrestricted release limits specified in the site Pre-Demolition Survey Plan. This structure can be demolished and the waste managed as PCB Bulk Product waste or as sanitary waste, and the concrete can be used for backfill on-site per the RFCA RSOP for Recycling Concrete. To ensure that the facility remains free of contamination and PDS data remain valid, Level 2 isolation controls are established.

1 INTRODUCTION

A Pre-Demolition Survey was performed to enable compliant disposition and waste management of the west side of the Building 771 Administration Area (referred to herein as Area AA West). Because this Type 3 building will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP). The results of this survey shall demonstrate that Area AA West meets the unrestricted release limits specified in the site Pre-Demolition Survey Plan. Building surfaces characterized as part of this PDS include interior surfaces of Area AA West.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed. Among these is Area AA. This facility no longer supports the RFETS mission and will be removed to reduce Site infrastructure, risks and/or operating costs.

Before this Type 3 facility can be demolished, the Data Quality Objectives (DQOs) for a Pre-Demolition Survey (PDS) must be satisfied; this document presents the PDS results for Area AA West. The PDS was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). The PDS is built upon physical, chemical and radiological hazards identified in the facility-specific *B771 and B774 Hazards Characterization Report for the 771 Closure Project*, dated June 12, 2001, Revision 0.

1.1 PURPOSE

The purpose of this report is to communicate and document the results of Area AA West. A PDS is performed prior to building demolition to define the pre-demolition radiological and chemical conditions of a facility. The pre-demolition conditions are compared with the release limits for radiological and non-radiological contaminants. PDS results will enable project personnel to make final disposition decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

1.2 SCOPE

This report presents the pre-demolition radiological and chemical conditions of the Area AA West surfaces that will be free-released and disposed of as sanitary waste, recycle metal, or used as backfill per the requirements of the *RFETS, RFCA RSOP for Recycling Concrete*.

1.3 DATA QUALITY OBJECTIVES

The Data Quality Objectives (DQOs) used in designing this PDS meet the minimum requirements specified in Section 2.0 of the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). Refer to section 2.0 of MAN-127-PDSP for these DQOs.

1.3.1 The Problem

The problem involves determining whether or not the survey unit is suitable for unrestricted release in accordance with this plan.

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1.3.2 The Decision

The decision is verification that objectives specified in the decommissioning decision document have been met (e.g., certain materials meet unrestricted release criteria for radiological and non-radiological constituents).

1.3.3 Inputs to the Decision

Inputs to the decision include the magnitude and location of data from preceding characterizations, including RLC and In-Process Characterization (IPC), PDS results, decision document action levels, and unrestricted release criteria.

1.3.4 Decision Boundaries

The decision boundaries are the spatial confines of the facility, including rooms and sets of rooms, in two and three dimensions. Interior surfaces are included, including those below grade. Boundaries may be further defined in RFCA decision documents.

1.3.5 Decision Rules

The following are decision rules to be used during PDS:

1.3.5.1 Radionuclides

If all radiological survey and scan measurements (and sample measurements, where sample activity is translated to surface activity as described in Section 7.2.3 of the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP)), are below the surface contamination guidelines specified in the Site PDSP, then the related areas and/or volume are considered not radiologically contaminated. The media sample result is calculated by converting volumetric activity (typically reported in pCi/g) to surface activity (dpm/100 cm^2). The volumetric result (pCi/g) is multiplied by the weight of the sample (grams) and by 2.22 (conversion from pCi to dpm).

If any radiological survey or scan measurement exceeds the surface contamination guidelines provided in the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP), the related survey unit must be evaluated per the statistical tests described in section 7.0, Data Analysis and Quality Assessment, of this plan. If any radiological sample measurement (or disposal unit volume) exceeds 100 nanocuries per gram of transuranic material, the related volume of material is considered transuranic (TRU) waste.

1.3.5.2 Hazardous Waste

If decommissioning waste is mixed with or contains a listed hazardous waste, or if the waste exhibits a characteristic of a hazardous waste, then the waste is considered RCRA-regulated hazardous waste in accordance with 6 CCR 1007-3, Parts 261 and 268.

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1.3.5.3 Hazardous Substances

If material contains a listed hazardous substance above a decision document action level (e.g., RFCA) and/or the CERCLA reportable quantity (40 CFR 302.4), the material is subject to CERCLA regulation (i.e., remediation and/or notification requirements).

1.3.5.4 Beryllium

If surface concentrations of beryllium are equal to or greater than 0.2 $\mu g/100\ cm^2$, the material is considered beryllium contaminated per 10 CFR 850.

1.3.5.5 PCBs

If material contains PCBs, in a non-liquid state, from the manufacturing process at concentrations ≥50 ppm, the material is considered PCB Bulk Product Waste and subject to the requirements of 40 CFR 761.

If PCB contamination from a past spill/release is suspected, or if a PCB spill is discovered that has not been cleaned up, the associated material is considered PCB Remediation Waste and subject to the requirements of 40 CFR 761. PCB remediation waste includes: materials disposed of prior to April 18, 1978, that are currently at concentrations ≥50 ppm PCBs, regardless of the concentration of the original spill; materials which are currently at any volume or concentration where the original source was ≥500 ppm PCBs beginning on April 18, 1978, or ≥50 ppm PCBs beginning on July 2, 1979; and materials which are currently at any concentration if the PCBs are spilled or released from a source not authorized for use under 40 CFR 761.

If a waste or item contains PCBs in regulated concentrations, the waste or item is classified as PCB-regulated material and subject to the requirements of 40 CFR 761.

1.3.5.6 Asbestos

If any one sample of a sample set representing a homogeneous medium results in a positive detection (i.e., >1% by volume), then material is considered ACM (40 CFR 763 and 5 CCR 1001-10).

1.3.6 Tolerable Limits on Decision Error

Acceptable false negative *(a)* errors for calculating the number of samples generally range from 1% to 10%. The default value specified by the Site PDSP is 5%, which was assumed for the survey design in this report.

1.3.7 Optimization of Plan Design

Statistically based radiological surveying and sampling will be conducted per the guidance in Appendix B of the RFETS Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). Refer to Section 4.0 of the PDSP for direction of characterization of non-radiological, chemical constituents. For this report, the minimum number of

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measurement locations is fifteen per survey unit, as calculated based on the guidance in MAN-127-PDSP. The $DCGL_W$ is 100 dpm/100 cm^2 for TSA and media measurements/samples, and 20 dpm/100 cm^2 for RSA measurements. The LBGR was adjusted to obtain a relative shift of two. The estimated standard deviation for each measurement type was calculated based on an assumed coefficient of variation of 30%.

The scan requirements for specific survey unit classifications are as follows:

Class 2: 10-100% floors/lower walls
10-50% upper walls/ceilings

No Class 1 or Class 3 survey units are included in the scope of this report.

2 HISTORICAL SITE ASSESSMENT

A facility-specific Hazards Characterization Report was conducted to understand the facility history and related hazards. The Building 771 Hazards Characterization was performed in June 2001 (Refer *B771 and B774 Hazards Characterization Report for the 771 Closure Project*, dated June 12, 2001, Revision 0). Based on the characterization results, no radiological contamination was identified in Area AA West. The media sample results did not indicated radiological contamination in excess of the unrestricted release limits in or under the paint. However, Area AA West is considered a Type 3 facility based on its proximity to Building 771.

The area included in the scope of this PDSR is referred to herein Area AA West. This area was part of an addition to the original Building 771 that was constructed in 1966. This area was initially referred to as the 771B addition, but is commonly referred to as the Administration Area of Building 771. The west side of this area, which is included in the scope of this report, is also referred to as the Corridor B "Cold Office Area", and includes all of Corridor B and Offices 116, 117, 117A, 118, 119, 119A-D, 124, 125, 125A-E, 126, 126A, and 126B.

Area AA West consists of one Class 2 survey unit (771032) based the contamination potential, per Section 3.0 of the PDSP.

The hazards characterization results and historical review (refer to Attachment E) were used to identify PDS data gaps and needs, and to develop radiological and chemical PDS characterization packages. Characterization documentation is located in the Building 771 Characterization Project files.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

Area AA West was characterized for radiological hazards per the PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces. Measurements were performed to evaluate the contaminants of concern (weapons-grade plutonium isotopes). Based upon a review of the characterization data, historical and process knowledge, in-process survey data, building walk-downs, and the Site Pre-Demolition Survey Plan (MAN-127-PDSP), a

Radiological Characterization Plan was developed during the planning phase that describes the minimum survey requirements (refer to survey packages 771032). A Survey Unit Overview Map is presented in Attachment A. Based on hazard characterization data and historical and process knowledge, transuranic isotopes are the primary contaminants of concern in Buildings 771/774. Therefore, the PDS was performed to the transuranic PDS unrestricted release criteria. Individual radiological survey unit packages are maintained in the Building 771 Characterization Project files.

The Area AA West survey unit package was developed in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure.* Total surface activity (TSA) and removable surface activity (RSA) measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Structures.* Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis.* Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control.*

Per the reference procedures, the required number of measurement locations is fifteen (15) per 1000 square-meters of floor area for Class 2 survey units. Scans were required on 100% of floors/lower walls and 10% of upper wall/ceiling surfaces.

Radiological survey data, statistical analysis results, survey locations, and radiological scan maps are presented in Attachments B, *Radiological Data Summary and Survey Maps.*

Area AA West – (Survey Unit 771032)

The west side of Area AA is a Class 2 survey unit. This area includes all of Corridor B and Offices 116, 117, 117A, 118, 119, 119A-D, 124, 125, 125A-E, 126, 126A, and 126B. A total of 15 random TSA and RSA measurements, and 15 media samples were collected. Surface scans of 642 m^2 of floors/lower walls (100% of surfaces) and 81 m^2 of upper walls/ceiling (20% of surfaces) were performed.

All scans and surveys in survey unit 771032 were less than the applicable PDS transuranic DCGL values. Radiological survey data, statistical analysis results, survey locations, and radiological scan maps for survey unit 771032 are presented in Attachment B, *Survey Unit 771032 Radiological Data Summary and Survey Map.*

4 CHEMICAL CHARACTERIZATION AND HAZARDS

Based on a thorough review of historical and process knowledge, visual inspections, and personnel interviews, no additional chemical hazard sampling requirements were identified.

4.1 Asbestos

Asbestos containing building material is not present in or on Area AA West (previously removed).

4.2 Beryllium (Be)

Area AA is not and has never been a beryllium-controlled area. Per the Beryllium Sampling Decision Tree in the PDSP, seven (7) biased beryllium smear samples were collected in Area AA, in accordance with the PDSP and the *Beryllium Characterization Procedure,* PRO-536-BCPR, Revision 0, September 9, 1999.

All beryllium smear sample results were less than the investigative limit of 0.1 $\mu g/100cm^2$. PDS beryllium laboratory sample data and location maps are contained in Attachment C, *Chemical Data Summaries and Sample Maps*.

4.3 RCRA/CERCLA Constituents [including metals and volatile organic compounds (VOCs)]

Based upon the *B771 and B774 Hazards Characterization Report, 771 Closure Project,* Revision 0, dated June 12, 2001, personnel interviews, facility walk-downs, and historical process knowledge (WSRIC/WEMS), the Area AA did not contain hazardous waste storage units. A visual inspection of the building by 771/774 Industrial Hygiene personnel verified the absence of hazardous waste residuals and/or stains on the floor/concrete slab, walls, or ceiling. As a result of these observances, it has been determined that no sampling for RCRA/CERCLA constituents is required. The concrete generated from the demolition of the areas included in the scope of this report can be used for onsite recycling in accordance with the Concrete Recycling RSOP.

4.4 Polychlorinated Biphenyls (PCBs)

Based on historical knowledge, personnel interviews, and 771/774 Environmental Compliance Personnel walk-downs, Area AA never used/transferred free flowing/exposed PCB's. At one time the facility may have used PCB ballasts in its fluorescent light fixtures, however, all of these have been removed, and compliantly disposed of, resulting in no impact on demolition activities in this area.

Per the *B771 and B774 Hazards Characterization Report for the 771 Closure Project,* PCBs are present in some applied paints (i.e., on several walls and floors within the B771 and B774 Contamination Areas). Because additional paint sampling was not performed in Area AA, and because painted surfaces remain in the area (cinderblock and concrete walls), any painted debris generated during demolition that is not recycled on-site will be disposed of a PCB Bulk Product waste.

5 PHYSICAL HAZARDS

Physical hazards associated with Area AA are common to standard industrial environments, and include hazards associated with utilities. There are no other unique

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hazards associated with the facility. The facility has been relatively well maintained and is in good physical condition, therefore, does not present hazards associated with building deterioration.

Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practices.

6 DATA QUALITY ASSESSMENT

Data used in making management decisions for decommissioning of Area AA and consequent waste management, is of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments B and C) were verified and validated relative to MAN-127-PDSP, Pre-Demolition Survey Plan for D&D Facilities, and original project DQOs.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- the *number* of samples and surveys;
- the *types* of samples and surveys;
- the sampling/survey process as implemented "in the field"; and
- the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are presented in Attachment D. The DQA Checklists are provided in the individual survey unit packages (located in the Building 771 Characterization Files).

The Minimum Detectable Activity (MDA) for each PDS instrument was determined *a priori* based on typical parameters (background, efficiency, and count time). A list of radiological field instrumentation and associated sensitivities is presented in Table 1.

Table 1
PDS Radiological Field Instrumentation and Minimum Detectable Activities

Model	Measurement Type	MDA (dpm/100 cm^2)
NE Electra DP6	TSA	48
Eberline SAC-4	Removable (Smears)	10
NE Electra AP6	Scans	300

7 DECOMMISSIONING WASTE TYPES

The demolition and disposal of Area AC will generate a variety of wastes. Concrete can be used as backfill onsite in accordance with the RFCA RSOP for Recycling Concrete.

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, Area AA is classified as an RFCA Type 3 facility pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999). Based upon the results of this PDSR, Area AA West meets the unrestricted release limits specified in the site Pre-Demolition Survey Plan and is ready for demolition. The PDS for Area AA West was performed in accordance with the DDCP and PDSP, all PDSP DQOs were met, and all data satisfied the PDSP DQA criteria.

A facility walkdown and historical review indicates that no RCRA/CERCLA constituents exist in Area AA West (refer to Attachment E, Historical Review). Any painted debris generated during demolition that is not recycled on-site will be disposed of as PCB Bulk Product waste.

Radiological contamination in excess of the PDSP Table 7-1 limits was not detected in Area AA. The applicable limits are as follows:

Table 2
PDSP Table 7-1 Surface Contamination Limits

Radionuclides	**Total Average (dpm/100 cm^2) (1) ($DCGL_W$)**	**Total Maximum (dpm/100 cm^2) (2) ($DCGL_{EMC}$)**	**Removable (dpm/100 cm^2) ($DCGL_W$)**
Transuranics	100	300	20

(1) Measurements of average contamination should not be averaged over an area of more than 1 m^2.
(2) The maximum contamination level applies to an area of not more than 100 cm^2.

Based upon this PDSR, the Area AA West can be demolished and the waste managed as sanitary and the concrete can be used for backfill on-site per the RFCA RSOP for Recycling Concrete.

To ensure that the facility remains free of contamination and that PDS data remain valid, Level 2 isolation controls have been established.

9 REFERENCES

B771 and B774 Hazards Characterization Report for the 771 Closure Project, dated June 12, 2001, Revision 0.

DOE/RFFO, CDPHE, EPA, 1996. *Rocky Flats Cleanup Agreement (RFCA)*, July 19, 1996.

DOE Order 5400.5, *Radiation Protection of the Public and the Environment*

DOE Order 414.1A, *Quality Assurance*

EPA, 1994. *The Data Quality Objective Process,* EPA QA/G-4.

K-H, 1999. *Decommissioning Program Plan*, June 21, 1999.

MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.

MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.

MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 4, July 15, 2002.

MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 1, July 15, 2002.

MARSSIM - *Multi-Agency Radiation Survey and Site Investigation Manual* (NUREG-1575, EPA 402-R-97-016).

PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure,* Rev. 1, May 22, 2001.

PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures*, Rev. 2, March 10, 2003.

PRO-477-RSP-16.03, *Radiological Samples of Building Media*, Rev. 1, May 22, 2001.

PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-563-ACPR, *Asbestos Characterization Procedure,* Revision 0, August 24, 1999.

PRO-536-BCPR, *Beryllium Characterization Procedure*, Revision 0, August 24, 1999.

RFETS, Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition.

RFETS, Environmental Waste Compliance Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal.

RFETS, RFCA RSOP for Recycling Concrete, September 28, 1999

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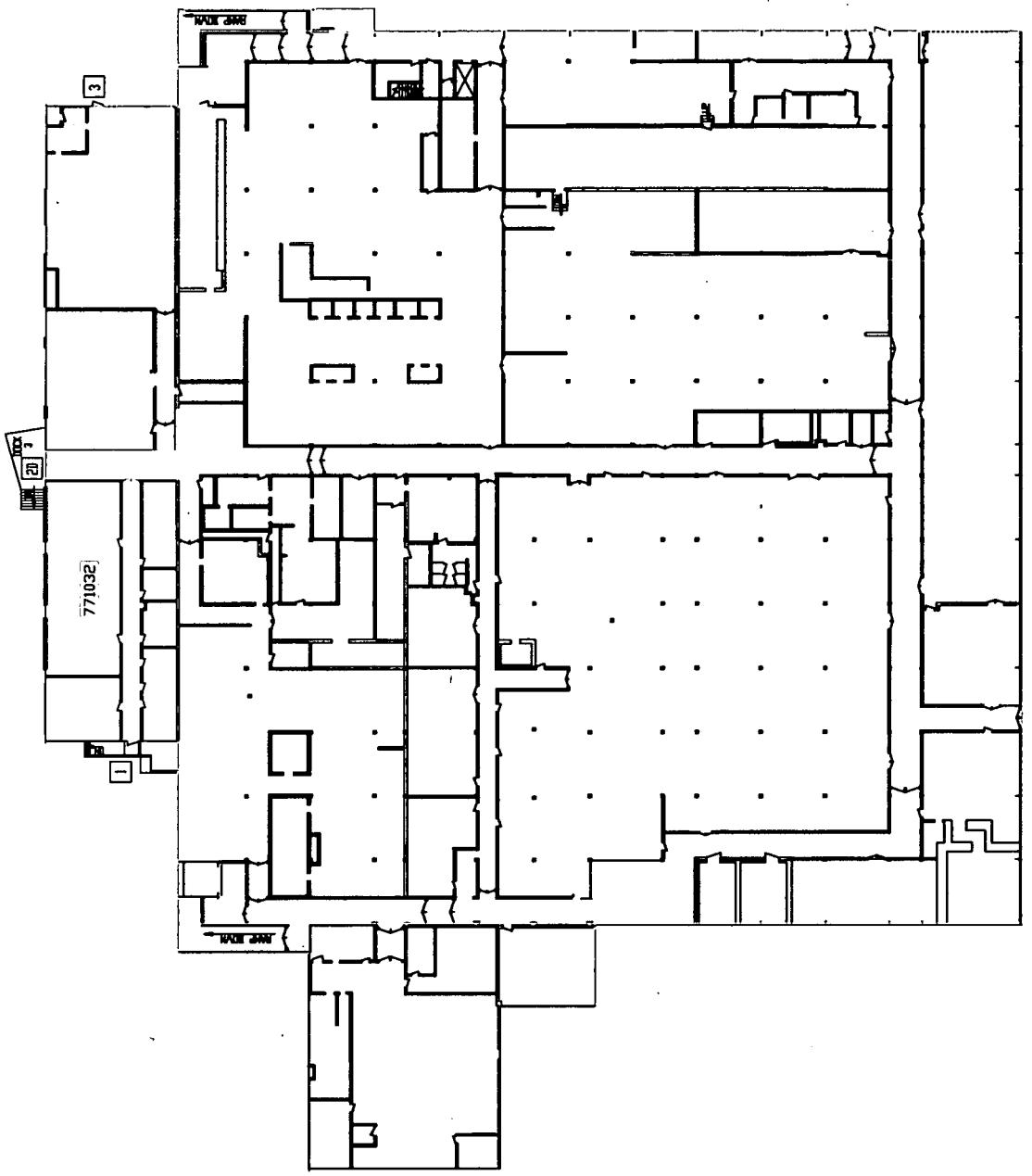
ATTACHMENT A

Survey Unit Overview Map

BLDG 771 Admin Area (AA)



ATTACHMENT B

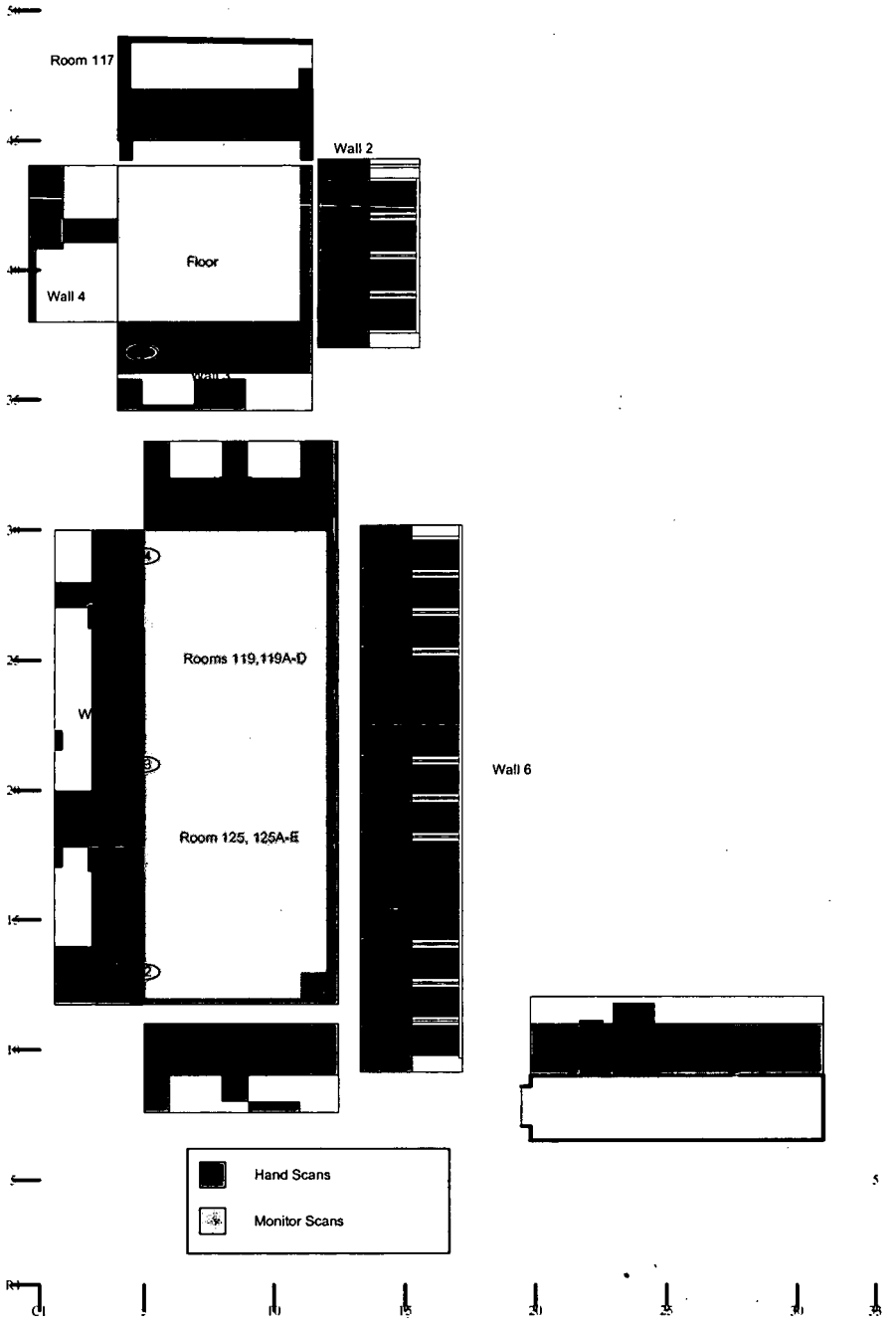
Survey Unit 771032
Radiological Data Summary and Survey Map

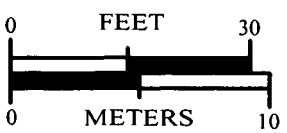
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AA **Survey Unit: 771032** **Classification: 2**
Building: 771
Survey Unit Description: Rooms 116-126, Corridor A (north)

Total Floor Area: 295 sq. m **Total Area: 1053 sq. m** **Grid Size: 8m x 8m**

SURVEY UNIT 771032 - MAP 1 OF 3





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SURVEY MAP LEGEND
Smear & TSC Location
Smear, TSC & Sample Location
Open/Inaccessible Area
Area in Another Location

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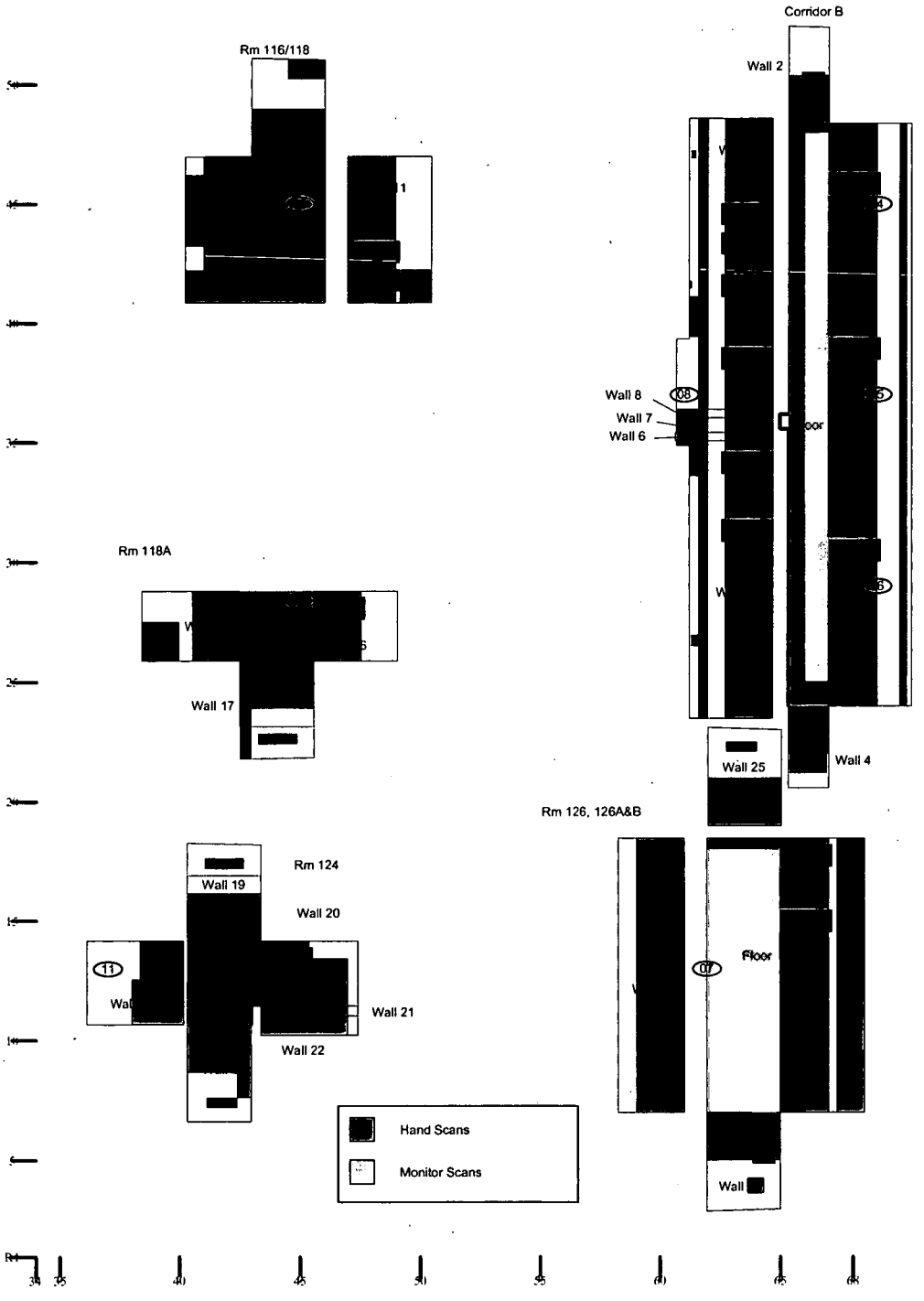
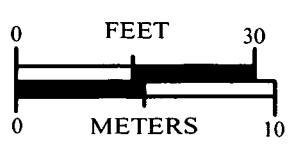
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AA **Survey Unit: 771032** **Classification:**
Building: 771
Survey Unit Description: Rooms 116-126, Corridor A (north)

Total Floor Area: 295 sq. m **Total Area: 1053 sq. m** **Grid Size: 8m x 8m**

SURVEY UNIT 771032 - MAP 2 OF 3





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SURVEY MAP LEGEND
Smear & TSC Location
Smear, TSC & Sample Location
Open/Inaccessible Area
Area in Another Location

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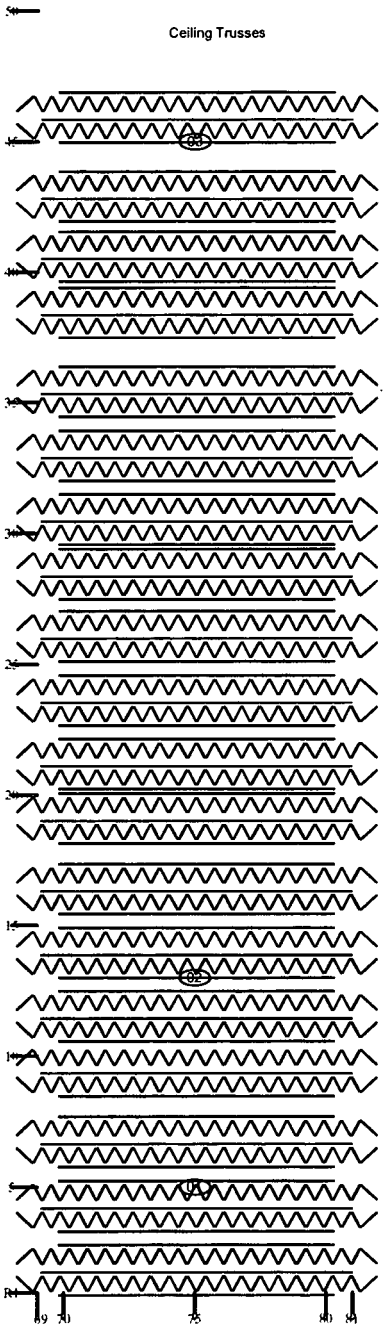
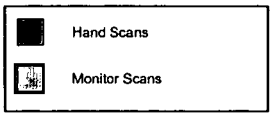
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

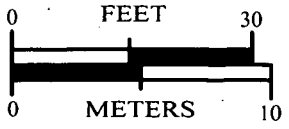
Survey Area: AA **Survey Unit: 771032** **Classification: 2**
Building: 771
Survey Unit Description: Rooms 116-126, Cooridor A (north)

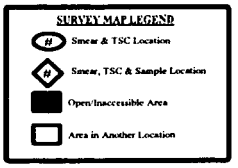
Total Floor Area: 295 sq. m **Total Area: 1053 sq. m** **Grid Size: 8m x 8m**

SURVEY UNIT 771032 - MAP 3 OF 3









Survey Area: AA	Survey Unit: 771032	Building: 771

Description: Admin. Area (west side)

Rocky Flats Environmental Technology Site
Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 15 | Nbr Biased Measurements Required: 0 | Nbr QC Required: 2

Nbr Random Measurements Performed: 15 | Nbr Biased Measurements Performed: 0 | Nbr QC Performed: 2

Alpha

Maximum:	34.1 dpm/100cm²
Minimum:	1.2 dpm/100cm²
Mean:	17.3 dpm/100cm²
Standard Deviation:	11.6
QC Maximum:	22.5 dpm/100cm²
QC Minimum:	14.2 dpm/100cm²
QC Mean:	18.4 dpm/100cm²
Transuranic DCGL$_W$:	100.0 dpm/100cm²
Transuranic DCGL$_{EMC}$:	300.0 dpm/100cm²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 15 | Nbr Biased Measurements Required: 0

Nbr Random Measurements Performed: 15 | Nbr Biased Measurements Performed: 0

Alpha

Maximum:	5.7 dpm/100cm²
Minimum:	-1.8 dpm/100cm²
Mean:	0.6 dpm/100cm²
Standard Deviation:	2.2
Transuranic DCGL$_W$:	20.0 dpm/100cm²

Media Sample Results

Nbr Random Required: 15 | Nbr Biased Required: 0

Nbr Random Collected: 15 | Nbr Biased Collected: 0

Uranium

Maximum:	NA dpm/100cm²
Minimum:	NA dpm/100cm²
Mean:	NA dpm/100cm²
Standard Deviation:	NA
Uranium DCGL$_W$:	5,000 dpm/100cm²
Uranium DCGL$_{EMC}$:	15,000 dpm/100cm²

Transuranic

Maximum:	16 dpm/100cm²
Minimum:	0 dpm/100cm²
Mean:	3 dpm/100cm²
Standard Deviation:	4
Transuranic DCGL$_W$:	100 dpm/100cm²
Transuranic DCGL$_{EMC}$:	300 dpm/100cm²

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

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Survey Area: AA	Survey Unit: 771032	Building: 771

Description: Admin. Area (west side)

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm²)		Survey Type
							Alpha	Beta	Alpha	Beta	
1	511760	07/05/04	Electra	1536	DP-6	12/22/04	0.218	NA	48.0	NA	T
2	511391	07/05/04	Electra	394	DP-6	12/04/04	0.223	NA	48.0	NA	T
3	516572	07/05/04	SAC-4	1178	NA	08/17/04	0.333	NA	10.0	10.0	R
4	516572	07/05/04	SAC-4	1410	NA	10/13/04	0.333	NA	10.0	10.0	R
5	516572	07/05/04	SAC-4	1185	NA	08/09/04	0.333	NA	10.0	10.0	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

Survey Area: AA	Survey Unit: 771032	Building: 771

Description: Admin. Area (west side)

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
771032PRP-N001	3	0.9	N/A	
771032PRP-N002	4	5.4	N/A	
771032PRP-N003	5	-0.3	N/A	
771032PRP-N004	3	-0.6	N/A	
771032PRP-N005	4	-0.6	N/A	
771032PRP-N006	5	-1.8	N/A	
771032PRP-N007	3	0.9	N/A	
771032PRP-N008	4	-0.6	N/A	
771032PRP-N009	5	-0.3	N/A	
771032PRP-N010	3	-0.6	N/A	
771032PRP-N011	4	-0.6	N/A	
771032PRP-N012	5	-0.3	N/A	
771032PRP-N013	3	-0.6	N/A	
771032PRP-N014	4	2.4	N/A	
771032PRP-N015	5	5.7	N/A	

Comments:

Survey Area: AA	Survey Unit: 771032	Building: 771

Description: Admin. Area (west side)

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
771032PRP-N001	1	16.8	N/A	
771032PRP-N002	2	4.0	N/A	
771032PRP-N003	1	32.0	N/A	
771032PRP-N004	2	13.0	N/A	
771032PRP-N005	1	10.4	N/A	
771032PRP-N006	2	9.9	N/A	
771032PRP-N007	1	10.4	N/A	
771032PRP-N008	2	25.1	N/A	
771032PRP-N009	1	4.4	N/A	
771032QRP-N010	1	14.2	N/A	
771032PRP-N010	2	9.9	N/A	
771032PRP-N011	1	26.0	N/A	
771032PRP-N012	2	34.1	N/A	
771032PRP-N013	1	28.8	N/A	
771032QRP-N013	2	22.5	N/A	
771032PRP-N014	2	34.1	N/A	
771032PRP-N015	1	1.2	N/A	

Comments:

Survey Area: AA	Survey Unit: 771032	Building: 771

Description: Admin. Area (west side)

Media Samples Data Sheet

Site Sample ID / Nbr Description	Nuclide	Sample (pCi/g)	Sample MDA (pCi/g)	Weight (g)	Surface Area (in^2)	Sample Nuclide ($dpm/100cm^2$)	Sample Nuclide MDA ($dpm/100cm^2$)	Sample Total ($dpm/100cm^2$)
00N0100-001.001 101	U234	NA	NA	4.91	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	0.0800	0.1800			1	1	**Transuranic**
	Am241	0.0270	0.2170			0	1	1
00N0100-002.001 102	U234	NA	NA	12.34	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	0.0060	0.1630			0	3	**Transuranic**
	Am241	0.0930	0.0840			2	1	2
00N0100-003.001 103	U234	NA	NA	13.69	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	0.0490	0.1470			1	3	**Transuranic**
	Am241	0.0000	0.0990			0	2	1
00N0100-004.001 104	U234	NA	NA	15.48	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	0.0600	0.1540			1	3	**Transuranic**
	Am241	0.0550	0.1650			1	3	2
00N0100-005.001 105	U234	NA	NA	9.27	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	1.1500	0.1920			14	2	**Transuranic**
	Am241	0.1940	0.1400			2	2	16
00N0100-006.001 106	U234	NA	NA	13.34	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	0.1640	0.1500			3	3	**Transuranic**
	Am241	0.0850	0.0770			2	1	4
00N0100-007.001 107	U234	NA	NA	13.15	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	-0.0060	0.1920			0	3	**Transuranic**
	Am241	0.0200	0.1570			0	3	0

Comments:

Survey Area: AA	Survey Unit: 771032	Building: 771

Description: Admin. Area (west side)

Media Samples Data Sheet

Site Sample ID / Nbr Description	Nuclide	Sample (pCi/g)	Sample MDA (pCi/g)	Weight (g)	Surface Area (in^2)	Sample Nuclide ($dpm/100cm^2$)	Sample Nuclide MDA ($dpm/100cm^2$)	Sample Total ($dpm/100cm^2$)
00N0100-008.001 108	U234	NA	NA	11.14	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	0.0550	0.0740			1	1	**Transuranic**
	Am241	0.0610	0.1830			1	3	2
00N0100-009.001 109	U234	NA	NA	6.17	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	0.0180	0.1470			0	1	**Transuranic**
	Am241	0.0360	0.0990			0	1	0
00N0100-010.001 110	U234	NA	NA	11.56	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	0.0460	0.1380			1	2	**Transuranic**
	Am241	0.0000	0.1070			0	2	1
00N0100-011.001 111	U234	NA	NA	20.15	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	0.0990	0.1320			3	4	**Transuranic**
	Am241	0.1900	0.0860			5	2	8
00N0100-012.001 112	U234	NA	NA	25.97	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	-0.0060	0.1980			0	7	**Transuranic**
	Am241	0.0170	0.1390			1	5	0
00N0100-013.001 113	U234	NA	NA	25.58	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	0.1340	0.1400			5	5	**Transuranic**
	Am241	-0.0120	0.1450			0	5	4
00N0100-014.001 114	U234	NA	NA	16.23	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	-0.0110	0.1330			0	3	**Transuranic**
	Am241	0.0000	0.0990			0	2	0

Survey Area: AA	Survey Unit: 771032	Building: 771

Description: Admin. Area (west side)

Media Samples Data Sheet

Site Sample ID / Nbr --- Description	Nuclide	Sample (pCi/g)	Sample MDA (pCi/g)	Weight (g)	Surface Area (in^2)	Sample Nuclide ($dpm/100cm^2$)	Sample Nuclide MDA ($dpm/100cm^2$)	Sample Total ($dpm/100cm^2$)
00N0100-015.001 115	U234	NA	NA	15.75	26.3	NA	NA	
DEFAULT	U235	NA	NA			NA	NA	**Uranium**
	U238	NA	NA			NA	NA	NA
	Pu239/240	-0.0210	0.1460			0	3	**Transuranic**
	Am241	0.0200	0.1620			0	3	0

ATTACHMENT C

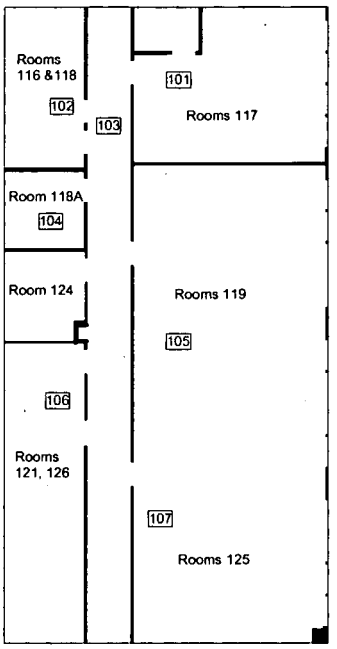
Chemical Data Summaries and Sample Maps

BERYLLIUM CHARACTERIZATION SURVEY FOR THE 771 CLUSTER

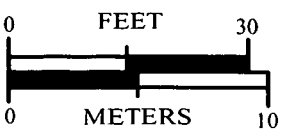
Survey Area: AA **Survey Unit: 771032 Be** **Classification: NA**
Building: 771
Survey Unit Description: Rooms 116-126, Corridor B

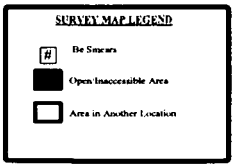
Total Floor Area: 3228 sq. ft. **Total Area: NA** **Grid Size: NA**

SURVEY UNIT 771032 Be - MAP 1 OF 1



Sample location	Sample Number	Sample Result
101 thru 107	771-06-17-2004-76-101 thru 107	<0.1 ug/100 sq. cm
	771-06-17-2004-76-122B-123B	Blanks





ATTACHMENT D

Data Quality Assessment

DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses (specifically beryllium).

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed; the radiological survey assessment is provided in Table E-1, and beryllium in E-2. A data completeness summary for all results is given in Table E-3.

All relevant Quality records supporting this report are maintained in the B771 Characterization Project Files. This report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of approval by the Regulators. All radiological data are organized into Survey Packages, which correlate to unique Survey Units. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Survey designs were implemented based on the transuranic limits used as DCGLs in the unrestricted release decision process. All survey results were evaluated against, and were less than the Transuranic $DCGL_w$ (100 dpm/100cm^2).

SUMMARY

In summary, the data presented in this report have been verified and validated relative to the quality requirements and project decisions as stated in the original DQOs. All data are useable based on qualifications stated herein and are considered satisfactory without qualification.

Based upon an independent review of the radiological data, it is determined that the original project DQOs satisfied site PDSP guidance. All facility contamination levels were below applicable unrestricted release levels, except as noted above. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable procedures, survey units were properly designed and bounded, and instrument performance and calibration were within acceptable limits.

Level 2 Isolation Controls have been implemented to prevent the inadvertent introduction of further contamination into the facility. On this basis, the B771 Admin. Area meets the RLCP and PDSP DQO criteria with the confidences stated herein.

Table E-1 V&V of Radiological Surveys – B771 Admin Area

V&V CRITERIA, RADIOLGICAL SURVEYS		K-H RSP 16.00 Series MARSSIM (NUREG-1575)		
QUALITY REQUIREMENTS				
Parameters		Measure	Frequency	COMMENTS
ACCURACY	initial calibrations	80%<x<120 %	≥1	Calibration using Alpha Group procedure and approved technicians.
	daily source checks	80%<x<120 %	≥1/day	Performed daily/within range.
	local area background: Field	typically < 10 dpm	≥1/day	All local area backgrounds were within expected Ranges <10 cpm
PRECISION	field duplicate measurements for TSA	≥5% of real survey points	≥100% packages	N/A
REPRESENTATIVENESS	MARSSIM methodology: Survey Unit 771032	statistical	NA	Random w/ statistical confidence.
	Survey Maps	NA	NA	Random measurement locations controlled/mapped to ±1m.
	Controlling Documents (Characterization Pkg; RSPs)	qualitative	NA	Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	units of measure	dpm/100cm^2	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual surveys usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	detection limits	TSA: ≤50 dpm/100cm^2 RA: ≤10 dpm/100cm^2	all measures	MDAs ≤ ½ $DCGL_w$ per MARSSIM guidelines.

Table E-2 V&V of Beryllium Results – B771 Admin. Area

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
BERYLLIUM	Prep: NMAM 7300 METHOD: OSHA ID-125G	LAB ---->	Johns Manville Corp. Denver, Co.	
QUALITY REQUIREMENTS		RIN ---->	RIN 771-06172004-76-101 thru 107	
		Measure	Frequency	COMMENTS
ACCURACY	Calibrations Initial	linear calibration	≥1	No qualifications significant enough to change project decisions, i.e., classification of Type 3 facilities confirmed. All results were below associated action levels.
	Continuing	80%<%R<120%	≥1	
	LCS/MS	80%<%R<120%	≥1	
	Blanks - lab & field	<MDL	≥1	
	interference check std (ICP)	NA	NA	
PRECISION	Laboratory Control Sample Duplicate	80%<%R<120% (RPD<20%)	≥1	
	field duplicate	all results < RL	≥1	
REPRESENTATIVENESS	COC	Qualitative	NA	
	hold times/preservation	Qualitative	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
COMPARABILITY	measurement units	ug/100cm^2	NA	
COMPLETENESS	Plan vs. Actual samples usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	detection limits	MDL of 0.10ug/100cm^2	all measures	

Table E-3 Data Completeness Summary – B771 Admin. Area

ANALYTE	Building/Area /Unit	Sample Number Planned (Real & QC)[A]	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Beryllium	B771 Admin Area	7 biased (interior) 2 Blanks	7 biased (interior) 2 Blanks	No beryllium contamination found at any location, all results below the regulatory limit	OSHA ID-125G RIN 771-06172004-76-101 thru 107 No results above action level (0.2ug/100cm^2) or investigative level (0.1ug/100cm^2).
Radiological	Survey Area: AA Survey Unit: 771032 B771 Admin. Area	15 α TSA (15 – Random/Systematic) and 15 α Smears (15 - Random/Systematic) 2 QC TSA 69% scanned	15 α TSA (15 – Random/Systematic) and 15 α Smears (15 - Random/Systematic) 2 QC TSA 69% scanned	No elevated contamination at any location; all values below PDS unrestricted release levels No result above action level	Transuranic DCGLs No result above action level

ATTACHMENT E

Historical Review

Area AA (B771 Administration Area)
Historical Review
July 6, 2004

Facility ID: Building 771 Administration Area (Survey Area AA)

Anticipated Facility Type (1, 2, or 3): Type 3 (Based on proximity to Building 771 only). Historically, this area was used as offices and the potential for contamination is very low.

Physical Description: The Building 771 AA Area is the former Administration Area located on the north side of Building 771. The west side of this building includes all of Corridor B and Offices 116, 117, 117A, 118, 119, 119A-D, 124, 125, 125A-E, 126, 126A, and 126B. The east side of this building includes all of Corridor F; Offices 103, 104, 105, 105A, 105B, 107, and 109; and the former cafeteria area 110, 110A, and 110B.

Historical Operations:
The Building 771 Administration Area (AA) was part of an addition to the original Building 771 that was constructed in 1966. The west side of Area AA was used for offices during building operations. The east side of Area AA housed offices and the cafeteria.

Current Operational Status
The Building 771 Administration Building (Area AA) is no longer operational. All major equipment/piping and non-load-bearing walls have been removed.

Contaminants of Concern

Asbestos
The Building 771 Administration Area (AA) was constructed in 1951, therefore the presence of ACM was suspected. A Certified Building Inspector performed a complete inspection of the area and sampled the suspect materials. Asbestos-Containing Material (ACM) was identified in the following materials:

- steam piping and components (TSI) (removed)
- drywall joint compound (removed)
- mudded fittings on domestic water and steam condensate piping (removed)
- silver-painted roof flashing (to be removed per the demolition plan)

Beryllium (Be)
The Building 771 Administration Building (AA) is not an RFETS Beryllium (Be) Area, based on historical and existing classifications, and historical use.

Lead
The remaining paint in the AA area will not be removed from the substrate.

A visual inspection of Area AC by 771/774 Environmental Compliance personnel verified the absence of hazardous waste residuals and/or stains on the floor/concrete slab, walls, or ceiling.

Although the AA Area paint was not specifically sampled and evaluated for lead, the samples collected from other areas of Building 771 are considered representative of the expected lead levels in Area AC. Analysis of 61 paint samples from the process areas of the 771/774 complex indicates that lead levels are below regulatory limits in paint.

RCRA/CERCLA Constituents
A visual inspection of Area AA by 771/774 Environmental Compliance personnel verified the absence of hazardous waste residuals and/or stains on the floor/concrete slab, walls, or ceiling. As a result of these observances, it has been determined that no additional sampling for RCRA/CERCLA constituents is required.

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Area AA (B771 Administration Area)
Historical Review
July 6, 2004

PCBs

Free-flowing or exposed PCBs have never been used or transferred in Area AA. PCB ballasts in fluorescent light fixtures were present throughout the area, and have been removed and disposed of.

Radiological Contaminants

The contaminants of concern for the 771 project, including all areas of Buildings 771 and 774, are transuranic alpha-emitting radioisotopes (including Pu-238, Pu-239/240, Pu-242, and Am-241). Based on findings documented in Radiological Engineering TBD-00161, Rev. 0, alpha-only surveys assure that the unrestricted-release limits for any other isotopes that may exist in Building 771/774 will not be exceeded.

Area AA was considered a "cold" area, meaning that the area was not posted or controlled as a radiological area. No radiological contamination in excess of the unrestricted release limits was detected during characterization efforts.

A release of contamination did occur in the former cafeteria area (Room 110) when a plutonium source was dropped, resulting in the release of low-levels of contamination on the floor of Room 110. All of the floor tile was removed and contamination remediated following the incident.

Environmental Restoration Concerns

UBC sampling performed inside the B771 footprint has been performed. Based on the preliminary results, no remedial action is anticipated.

Additional Information

None

References

(1) *B771 and B774 Hazards Characterization Report for the 771 Closure Project*, dated June 12, 2001, Revision 0.
(2) *Building 771/774 Cluster Closure Project Reconnaissance Level Characterization Report*, dated August 8, 1998, Revision 2.

Further Actions

Complete the PDS process.

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